What is claimed is:

1. A process for producing amphiphilic nanoscale particles which have, on the surface, hydrolyzable radicals which are lipophilic, which process comprises a) the hydrolysis and condensation of one or more hydrolyzable compounds which include at least one lipophilic hydrolyzable group with a substoichiometric amount of water and b) the removal of solvent in order to obtain the resulting amphiphilic particles with hydrolyzable radicals as powder.

2. The process for producing amphiphilic nanoscale particles as claimed in claim 1, characterized in that the hydrolyzable compound is a hydrolyzable metal or semimetal compound which optionally includes one or more non-hydrolyzable groups, or is a condensation product derived therefrom.

3. The process for producing amphiphilic nanoscale particles as claimed in claim 1 or 2, characterized in that the hydrolyzable compound is an alkoxide.

4. The process for producing amphiphilic nanoscale particles as claimed in one of claims 1 to 3, characterized in that the hydrolyzable compound is selected from Mg, Si, Ge, Al, B, Zn, Cd, Ti, Zr, Ce, Sn, In, La, Fe, Cu, Ta, Nb, V, Mo or W compounds, or condensation products derived therefrom.

5. The process for producing amphiphilic nanoscale particles as claimed in one of claims 1 to 4, characterized in that the hydrolyzable radical includes a lipophilic moiety composed of at least 4, preferably at least 5 carbon atoms.

6. The process for producing amphiphilic nanoscale particles as claimed in one of claims 1 to 5, characterized in that the resulting amphiphilic particles having hydrolyzable radicals are modified with a surface modifier in order to supplement the amphiphilic particles with function groups on the surface, the reaction optionally being carried out in a solvent.

7. The process for producing amphiphilic nanoscale particles as claimed in claim 6, characterized in that the surface modifier is a saturated or unsaturated carboxylic acid, a β-dicarbonyl compound, an amine, a phosphonic acid, a sulfonic acid or a silane.

8. The process for producing amphiphilic nanoscale particles as claimed in claim 6 or 7, characterized in that the surface modifier, in addition to at least one functional group for attachment or complexation to the surface of the particles, has at least one further functional group.

9. The process for producing amphiphilic nanoscale particles as claimed in one of claims 6 to 8, characterized in that the surface modifier is a complexing agent.

10. Amphiphilic nanoscale particles which have, on the surface, hydrolyzable radicals which are lipophilic.

11. The amphiphilic nanoscale particles as claimed in claim 10, characterized in that the hydrolyzable radical includes a lipophilic moiety composed of at least 4, preferably at least 5 carbon atoms.

12. The amphiphilic nanoscale particles as claimed in claim 10 or 11, characterized in that the hydrolyzable radical is an alkoxy, alkenyloxy, alkynyloxy, aryloxy, aralkyloxy, alkaryloxy, ether, acyloxy, alkyl or acyl radical which is optionally fluorinated.

13. The amphiphilic nanoscale particles as claimed in one of claims 10 to 12, characterized in that the hydrolyzable radical is a C_4-C_{20}-alkoxy radical, in particular a pentoxy or hexoxy radical.

14. The amphiphilic nanoscale particles as claimed in one of claims 10 to 13, characterized in that the hydrolyzable radicals stem from hydrolyzable precursors of the particles.

15. The amphiphilic nanoscale particles as claimed in one of claims 10 to 14, characterized in that the particles comprise one or more oxides of one or more metals or semimetals, the oxides optionally being hydrated.

16. The amphiphilic nanoscale particles as claimed in one of claims 10 to 15, characterized in that the particles comprise a compound of one or more metals or semimetals selected from Mg, Si, Ge, Al, B, Zn, Cd, Ti, Zr, Ce, Sn, In, La, Fe, Cu, Ta, Nb, V, Mo or W.

17. The amphiphilic nanoscale particles as claimed in one of claims 10 to 16,

characterized in that the particles have been surface-modified with function groups.

18. The amphiphilic nanoscale particles as claimed in claim 17, characterized in that the function group comprises at least one functional group.

19. The amphiphilic nanoscale particles as claimed in claim 18, characterized in that the functional group is capable of entering into crosslinking reactions with functional groups of the same type or of a different type.

20. The amphiphilic nanoscale particles as claimed in claim 18 or 19, characterized in that the functional group is a hydroxyl, epoxy, thiol, amino, carboxyl, carboxylic anhydride, isocyanate, sulfonic acid, phosphonic acid, quaternary amine, C-C double bond, fluorinated hydrocarbon or carbonyl group.

21. The amphiphilic nanoscale particles as claimed in one of claims 10 to 20, characterized in that the particles have been doped.

22. The amphiphilic nanoscale particles one of claims 10 to 21, characterized in that they are present in the form of a powder.

23. The amphiphilic nanoscale particles one of claims 10 to 22, characterized in that they have a coating of another material to form a core/shell system.

24. A composition comprising amphiphilic nanoscale particles as claimed in one of claims 10 to 23 and a matrix-forming material.

25. The composition as claimed in claim 24, characterized in that the amphiphilic particles, by virtue of surface modification, have functional groups which can enter into crosslinking reactions with functional groups of the matrix-forming material.

26. The composition as claimed in claim 24 or 25, characterized in that the composition is a coating composition, an adhesive, a resin composition, a sealant, a paste, a molding composition or a slip.